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## Hospitalization and Child Development: Effects on Sleep, Developmental Stages, and Separation Anxiety

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Hospitalization and Child Development: Effects on Sleep, Developmental Stages, and  
Separation Anxiety

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Spring 2020

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**Abstract**

Childhood development has been an important topic for those in the medical field, as well as parents. The way a child develops can determine the way they act, think, and mature.

Hospitalizations, acute and chronic, may affect the process of proper child development.

Literature is reviewed to support the presented pilot study that focuses on the immediate effects of hospitalization on a child's sleep disturbances, regression to lower developmental stages, and separation anxiety. The collected data determined the need for refinement of the survey tool and presented with possible correlations between hospitalizations and childhood development.

*Keywords:* hospitalization, childhood development, sleep disturbance, separation anxiety, developmental regression

### **Introduction**

When a child is born, parents, family members, and even medical professionals wish for a healthy child. However, it is inevitable that illness will occur during childhood. Whether it be an acute illness, such as the common cold, or a chronic illness, such as cystic fibrosis, childhood illnesses are inevitable. Although it is tough for us adults to see the pediatric population in the hospital, imagine the effect hospital stays have on the pediatric population itself. Children who experience long-term critical care may experience different forms of trauma that can ultimately affect their cognitive, emotional, and psychosocial development

### **Problem Statement**

According to an article titled “Trends in Pediatric Hospitalizations and Readmissions: 2010-2016”, although the number of pediatric hospitalizations are decreasing, the number of readmissions for children with complex chronic conditions are increasing (Bucholz, Toomey & Shuster, 2019). With this, a growing number of the pediatric population are experiencing long-term hospitalizations and treatments. Simple doctors’ visits can already be a traumatic experience for a young child, so a long-term hospitalization could be terrifying. The National Child Traumatic Stress Network states that “Many ill or injured children and their families (up to 80%) experience some traumatic stress reactions following a life-threatening illness, injury, or painful medical procedure. Healthcare professionals may tend to disregard the developmental effects of hospitalizations on a child and focus more on the treatments of their diagnosis. Overall, the potential effects on the development of a child experiencing short-term treatments, such as ear irrigation greatly differs from the potential effects on the development of a child experiencing long-term treatments such as chemotherapy treatment, traction, or injury recovery. Healthcare professionals need to realize these differences and implement supportive

interventions. Literature discussed in this paper has shown that longer hospitalizations affect sleep disturbances, separation anxiety and regression to lower developmental stages.

### **Study Purpose Statement**

This pilot study tested the content validity of a tool designed to measure the immediate effects of hospitalization on sleep disturbances, regression to lower developmental stages, and separation anxiety in children for possible use in future research.

### **Research Question**

In this paper, the following question will be considered: Do hospitalizations during childhood have immediate effects on sleep disturbances, regression to lower developmental stages and separation anxiety?

### **Theoretical Framework**

For this study, Erik Erikson's stages of psychosocial development is used for the theoretical framework (McLeod, 2018). Erik Erikson's theory of development consist of 8 stages that spans infancy up until adulthood. Each stage is associated with a basic struggle or characteristic. If an individual fails to succeed in completing a stage, they may develop unhealthy personality traits. During hospitalization, these stages may not be met due to procedures, limitations, or the circumstances surrounding the child's diagnoses (McLeod, 2018).

### **Childhood Development**

Normal childhood development is characterized by multiple factors and milestones, or behaviors, based upon age. There are five different age groups beginning from infancy through adolescence (infants, toddler, pre-school, school-age, and adolescence). Although

developmental milestones are referred to by healthcare professionals and parents, they are not definitive guidelines for childhood development; they serve as references based on normative populations (U.S. Department of Health and Human Services, 2019).

Typically, parents focus on the physical development of children when monitoring the growth of their child. Actions such as a child having the abilities to raise its head, push their chest up, roll over, crawl, stand, walk, and run are considered physical milestones of importance. Parents monitor these specific physical milestones to ensure that their child is developing normally.

Social milestones for the pediatric population include smiling, copying facial expressions, responding to others' emotions, show affection to familiar people, and play with self or others. In regard to play, there are different stages of play for each age range, solitary, parallel, associative, and cooperative. Solitary play occurs during infancy when the child keeps occupied with toys and self. Toddlers participate in parallel play where they can sit near peers but will choose to play by themselves. Associative play occurs in pre-school aged children. This is when children begin playing "make-believe" and begin associating themselves with their peers. Lastly, cooperative play is seen in school-aged children where they begin to play games with rules and begin to join teams (U.S. Department of Health and Human Services, 2019).

Cognitive, emotional, and psychosocial development can be represented by theories, such as Freud's Psychosexual Developmental Theory, Erikson's Psychosocial Developmental Theory, John B. Watson and B. F. Skinner's Theories of Behavior, and Piaget's Cognitive Developmental Theory (Cherry, 2019). These theories also describe milestones that children should reach during each age range that explain the behaviors that children are exhibiting. For example, in Freud's Psychosexual Developmental Theory, stages are defined by areas of the



body that give off pleasure. Children from infancy up to a year are considered in the oral stage where they find pleasure from sucking, tasting, and placing objects in their mouth. According to Freud's theory, if a child fails to progress to the next stage, they may develop a fixation on that certain area of the body. In Erikson's Psychosocial Theory of Development, toddlers will be in the stage of autonomy versus shame and doubt. What this means, is that children within this age range will learn how to complete tasks on their own; however, if not given the opportunity, the child will become ashamed of completing tasks and doubt their decisions. Watson and Skinner's Theories of Behavior state that a child's behavior is influenced by rewards, punishments, and their surrounding environment, such as the behaviors of their parents and the setting they were raised in. Lastly, Piaget's Cognitive Developmental Theory is defined by four stages which describe what thoughts a child can ideally understand and formulate at certain age ranges. For example, children ages 7 to 11 would ideally be able to understand concrete concepts, however they cannot understand abstract thought (Cherry, 2019).

Although the theories and milestones have been created and defined to monitor the development of a child, they are only used as benchmarks because children do not all develop at the same pace or could be considered developmentally delayed. Some children may complete a milestone months before defined, or they may complete the milestone months after, which could possibly raise concern. Overall, when children are admitted into the hospital, they must follow strict rules and regulations depending on their diagnoses, such as being restricted from leaving their rooms or beds, short visitation hours or no visitation, the inability to have their favorite toys, or even the inability to get a full night of sleep due to lab procedures and medication administration. Ultimately, these factors disrupt proper physical, social, and cognitive development.

## **Literature Review and Critique**

### **Sleep Disturbances**

Patients experiencing any length of hospitalization may have encountered issues with sleep disturbances. Multiple reasons may contribute to sleep disturbances which include multiple vital sign checks, equipment alarms, the sound of doors opening and closing, noises from the floor or roommates, individuals talking loudly, pain, lights, and even individual worry about their diagnosis, school, or family. According to the study titled “Patient and parent sleep in a children’s hospital”, pediatric patients experienced “later wake times, more night waking, and a shorter total sleep time” compared to their sleep habits at home due to the reasons mentioned previously; vital signs and pain being the main reasons (Meltzer, Davis & Mindell, 2012). Sleep plays a vital “role in the health and well-being of patients”, especially for growing children. Ultimately, consistent sleep disturbances impact a child’s healing and immune process, which can prolong hospitalization (Meltzer, Davis & Mindell, 2012).

### **Cognitive Development**

The article written by Bell et al. (2016) was the only article that focused on the effects of recurrent hospitalizations and chronic illness on cognitive development. The article “Chronic Illness and Developmental Vulnerability at School Entry” collected data through a randomized method, Australian Early Development Census record (AEDC), and linked administrative population data, to determine whether having a chronic illness ultimately affected a child’s academics. The study included a total of 22,890 school-aged children born between the years 2003 and 2004 in Western Australia. The AEDC was used as a benchmark for developmental outcomes in children, referencing the Canadian Early Development Instrument, which is a checklist completed by teachers to determine a child’s school readiness. The scores collected

through the AEDC were further analyzed through a logistic regression model and the Statistical Analysis System version 9.3 (Bell et al., 2016).

Through their study, the researchers discovered that “children were ~20% to 35% more likely to be classified as vulnerable/at-risk on all AEDC domains if they had a chronic illness, compared with their well peers” (Bell Et al., 2016). Not only this, they were able to conclude that even one chronic illness can make an impact on a child’s cognitive development; those with multiple chronic illnesses became slightly more at risk for developmental deficits. Strengths of this study included the large population size, minimization of bias, and ethics approvals “by the Western Australian (WA) Department of Health Human Research Ethics Committee, the University of Western Australia Human Research Ethics Committee, and the WA Aboriginal Health Ethics Committee” (Bell et al., 2016). However, stated limitations of the study included a lack of information about socioeconomic demographics and bias due to a majority of the hospitalized populations being low-income groups (Bell et al., 2016).

### **Emotional Development**

The article “Behavioral Impact of Sickle Cell Disease in Young Children with Repeated Hospitalization” by Bakri et al., analyzed two groups of Saudi Arabian children ages 1 ½ to 5 years old, half who were diagnosed with sickle cell disease and half who were not. The study was approved by the Al-Ahsa Hospital research and ethic committee. The research study was conducted through interviews by a researcher-approved nurse and the parent of the child. Furthermore, the parent of the child were asked to complete the Arab versions of the Child Behavior Checklist and the Diagnostic and Statistical-Oriented scale (DSM-IV-TR), which are both standardized parent-report questionnaires that can identify pre-existing psychological or emotional issues affecting the child. Answers were then based on a three-point scale and

analyzed through the Statistical Package for Social Science (SPSS) version 17.0 (Bakri et al., 2014).

Data from the SPSS found statistically significant differences between the group of children with sickle cell disease the group without sickle cell disease. The researchers found that the group of children with sickle cell disease presented with more emotional reactivity, aggressive behavior, withdrawn behavior, anxiety issues, and oppositional defiant problems compared to the group without sickle cell disease. Although the researchers were able to find differences between the two groups, it is stated that the evidence is not concrete evidence due to the small sample size and the potential for parent bias during the interviews and through the questionnaires (Bakri et al., 2014).

A second article written by Khatuna Dolidze, Emma L. Smith, and Kate Tchanturia (2013) analyzed the emotional development of hospitalized children through self-portrait drawings. The study included 168 children hospitalized in the JoAnn Medical Center in the United Kingdom and 125 non-hospitalized children in surrounding pre-schools and grade-schools, for a total of 293 participants. The researchers used a conceptual framework and asked each child to draw a self-portrait using 12 colored pencils. A chi-squared analysis was used to analyze the drawings, where the drawings from non-hospitalized children were used as a comparison for drawings from hospitalized children (Dolidze, Smith & Tchanturia, 2013).

Through comparison, the researchers found that the drawings of children within the hospital setting commonly drew smaller limbs, use singular colors, and occasionally would omit body parts that were affected by their disease. The researchers believed that through this observation, health care professionals can gain a better understanding about the emotional well-being and of a child during hospitalization and use it as a form of nonverbal communication.

This study, overall, gave insight to a child's view of one's self during hospitalization, however the researchers stated that this research approach was "highly subjective and may need a second judge and second analysis for future studies" (Dolidze, Smith & Tchanturia, 2013).

### **Psychosocial Development**

Dawn Davies, Dawn Hartfield, and Tara Wren (2014) touched on the effects of hospitalizations on children in their article, "Children Who 'Grow Up' in Hospital: Inpatient Stays of Six Months or Longer", which accurately describes the type of study that was performed. This primary study focused on children from Western Canada.

This article states that the number of children entering the pediatric intensive care unit has steadily increased. Specifically, in the United States the number of pediatric patients in the PICU doubled. The purpose of the study was to gain a better understanding of the type of pediatric population that experience long-term critical care. This is significant to nursing because it can determine if a trend in demographics exists in this population. The researchers gathered data to develop a description of the pediatric population in critical care. The article was critically reviewed and funded by the University of Alberta. Furthermore, the article was published in a book and was also approved by the Health Research Ethics Board at the University of Alberta. The article had proper organization and subheadings that described exact research focus, methods, and results (Davies, Hartfield & Wren, 2014).

Although vague, the purpose of the study was stated as, "to describe the population of children who experienced a very long hospital stay," which was defined by a retrospective study. The sample population is clearly stated and is statistically described in a table, which includes categorizations based upon diagnoses. The data collection method was briefly stated as an automated analysis system (Davies, Hartfield & Wren, 2014).

The authors discussed, in the results section, how the individuals included in the study all experienced long-term hospitalizations as well as recurring hospitalizations for other medical conditions related to their original diagnosis. Along with this, the researchers discovered 24 out of the 61 patients experienced some form of anxiety, depression, delirium, and attachment issues (Davies, Hartfield & Wren, 2014).

Two of the articles found with relation to the question of this essay focused mainly on the impact of hospitalization on psychological development. A common theme was found between the articles where the studies focused mainly on a population undergoing oncology treatment or hospitalization in the pediatric intensive care unit. The articles conducted research studies that included a quantitative, descriptive study and a mixed-methods cohort study, respectively. Both studies conducted their research through interviews with the parents and the children. The interviews included standardized questions and occurred either during hospitalization (for oncology patients) or post-operatively (for PICU patients). Questions during the interviews asked parents about their child's typical psychological and social behaviors and what the child's behavior was like during hospitalization or post-hospitalization. The data were analyzed through statistical technology, Statistical Package for Social Science version (16) and SAS version 9.3, which were able to turn the descriptive data into quantitative, comparable evidence (Rennick et al., 2014; Obaid, 2015).

The study conducted by Rennick et al., unfortunately was inconclusive, due to the fact that the mentioned research study was not conducted at the time. Furthermore, the study was expected to be conducted for about three years. In regard to the study by Obaid, results found that "about (66.0%) of children experience mild psychosocial effects during inpatient stays."

However, once again, the study was limited by the subjective nature of the study; data was collected through a questionnaire and parent input (Rennick et al., 2014; Obaid, 2015).

### **Separation Anxiety**

According to the literature, there are three phases of child separation anxiety: protest, denial, and detachment. The longer a child is separated from their parent, the more they will refuse to interact with their parent. In the article titled “The young child’s response to hospitalization: separation anxiety or lack of mother care?”, the author discovered that children who experienced hospitalization without a parent presence demonstrated “loud, angry, continuous crying to mournful sadness and withdrawal from others”. Whereas, children with a parent presence or substitute parent “played more, cried less, and interacted more with others...” (Branstetter, 1969). The author mentioned that long-term separation could manifest behaviors similar to grief and mourning. “Long-term separation could better be described as stimulus deprivation or social deprivation with lack of opportunity for establishing an attachment relationship with a constant caretaker.” (Branstetter, 1969).

### **Interventions**

The remaining two articles by Nathiana B. Silva and Fla’via L. Oso’rio and William H. C. Li et al. focused on the impact of interventions on childhood development and psychological well-being within the pediatric oncology unit and general pediatric unit, respectively. Interventions explored introduced animal-assisted therapy, play therapy with toys, and social interactions with peers. Pain scales, quality of life evaluation scales, anxiety scales, and children’s emotional manifestation scales were used to determine if the proposed interventions made a difference in the children’s hospital experiences, since these tools have established reliability within the hospital setting. Collectively, both studies found that the implementation of

play interventions within the hospital setting were able to decrease stress, anxiety, and depression symptoms in both the patients and their caregivers (Li et al., 2016; Silva & Oso'rio, 2018).

## **Methods**

### **Research Design**

The pilot study tested the content validity of the survey tool used to measure the immediate effects of hospitalization on sleep disturbances, regression to lower developmental stages, and separation anxiety. If valid, the tool may be used in future studies regarding immediate effects of hospitalization on sleep disturbances, regression to lower developmental stages, and separation anxiety. Furthermore, the use of the tool can be used to discover trends that can inspire further research.

### **Human Subjects Review**

The benefits and risks were considered when conducting the study. Completing the survey would provide participants an opportunity to reflect on their child's behavioral changes immediately after hospitalization and aid in the validation of the survey tool. However, upon completion of the survey, participants risked losing anonymity by inadvertently disclosing personal information. To minimize the risk to participants, the survey was completely anonymous; names, ages, and birthdates of participants were not included. Furthermore, the survey was voluntary and participants were able to withdraw participation at any time. The survey cost the participant about 10 to 15 minutes of their time. A consent cover letter was also provided with the survey link, and the completion of the survey established the participants consent. To further ensure confidentiality, the survey results and data were kept within a password-protected Google Survey folder in a password-protected computer. All data was



revealed only to the student's faculty advisor and the student herself and will be deleted within one of collection. The study was reviewed and approved by Dominican University of California's Institutional Review Board for the Protection of Human Participants (IRBPHP).

### **Population**

The population of this study included pediatric registered nurses with at least one child. The population included past and current pediatric nurses, as long as they had at least one year of experience on a hospital pediatric unit. To be included in the survey, the participants' children must have also been admitted into a hospital setting at least once. Possible dual relationships existed between researcher and participants. Potential participants included current Dominican nursing professors, clinical preceptors, or family members. Participants who did not have a valid license, who have not worked on a pediatric unit for at least one year, and who did not have children, were excluded from the study.

A total of 9 responses were collected for the survey, with 20 to 30 responses being the ideal number. Due to lack of responses, past and present neonatal intensive care unit nurses were included in the survey participation.

### **Instrument**

The instrument used for the study was an online survey created by the researcher and distributed through Google Survey. The survey included thirteen questions that evaluated the immediate effects of hospitalization on their child's sleep disturbances, regression to lower developmental stages, and separation anxiety. The survey questions included short answer and multiple-choice responses. An additional six questions were included at the end of the survey to ask participants their amount of work experience, as well as the adequacy of the survey questions. To validate the survey, three of the six questions asked participants if the survey

questions adequately elicited parents' perceptions about their child's separation anxiety, regression to lower developmental stages, and sleep disturbances. The sixth question asked participants what questions should be added to improve the survey tool. The survey was anonymous, and participants were able to withdraw participation at any point. (See Appendix D for a copy of the survey questions.)

### **Procedures**

Participants were contacted and referred through snowball sampling. The researcher's past nursing professors, clinical instructors, and colleagues were initially contacted and sent a description of the survey and the survey link through email and text. Towards the end of the end of the data collection process, the survey link was further posted on social, through Facebook, and was sent to family members and friends in the nursing profession. Once contacted, the participants received a link to the survey and were asked to voluntarily review and answer the questions. No identifying information was solicited, and the participant was asked to spend approximately 10 to 15 minutes completing the online survey. They were able to exit the survey at any time without consequence to them. Because the respondents are themselves health care professionals, they were not only asked about their personal experiences with their child's hospitalization, but they also had an opportunity to provide feedback about their perceptions of the face and content validity of the survey instrument.

### **Data Analyses**

The data was analyzed through Google Survey. Select questions were quantitatively analyzed by the program and the data was generated into pie charts. The remaining questions were qualitatively analyzed by the researcher.

### **Validity**

The survey tool was created to analyze the immediate effects of hospitalization on a child and was meant to answer the research question: Do hospitalizations during childhood have immediate effects on sleep disturbances, regression to lower developmental stages and separation anxiety? The survey questions were reviewed and approved by two Dominican University nursing professors and the Nursing Department Chair. The survey questions were further approved by the Dominican University of California's Institutional Review Board for the Protection of Human Participants (IRBPHP).

### **Reliability**

The purpose of the study was to test the content validity of the instrument itself. Therefore, descriptive statistics were analyzed but reliability was not measured during the survey period.

## **Results**

### **Survey Results**

A total of 9 responses were collected at the end of the survey period. According to the data, the age range of the participants' children ranged from as young as 28 weeks old to 15 years old; four (44.4%) of them being 2 years old. The lengths of hospital stays varied, the shortest being one night and the longest being 2 ½ months; two participants (22.2%) both stayed for one night.

When asked if the participant stayed with the child during admission, 8 (88.9%) participants stated they always stayed with their child and 1 (11.1%) sometimes stayed with their child. When questioned when they stayed with their child, all 9 participants stated that they stayed both days and nights in the hospital. Out of the 9 participants, only 3 (33.3%) were

previously separated from their child. The shortest amount of time of separation was 2 days and the longest was one week.

To analyze the immediate effects of hospitalization on separation anxiety, participants were asked if their child interacted differently towards the participant or family members, if the child cried more, and if the child had difficulty being left alone. Four (44.4%) participants stated that their child acted differently toward the participants themselves and their family members. Three (33.3%) participants noted that their child tended to cry more after hospitalization. Two (22.2%) participants noted their child having difficulty being left alone and another two (22.2%) answered that they “maybe” noticed their child having difficulty being left alone.

One question asked about changes in the child’s sleeping patterns after hospitalization. Upon review, only two participants (22.2%) stated they saw a change in their child’s sleeping patterns.

The remaining three questions evaluated regression to lower developmental stages after hospitalization. Two participants (22.2%) stated that they noticed their child “taking a step back” in any aspect of their development. One (11.1%) participant noticed a worsening in their child’s schoolwork and two (22.2%) participants noticed a difference in the way their child interacted with friends and peers at school.

### **Survey Evaluation Results**

The second part of the survey asked participants to state their amount of experience working as a registered pediatric nurse and to evaluate the survey tool they took. Six participants had experience on a hospital pediatric unit, with experience ranging from 2 years to 25 years. Two participants had experience in a NICU setting, with experience ranging from 1 year to 16 years. Participants were then asked if they thought parents would be willing to answer the

survey questions. Four (44.4%) participants responded yes, four (44.4%) participants responded maybe, and one (11.1%) participant responded no.

Participants were asked if the survey adequately elicited parents' perceptions about their child's possible separation anxiety. Seven (77.8%) participants said yes and 2 (22.2%) participants said maybe. Next, participants were asked if the survey adequately elicited parents' perceptions about their child's possible developmental regression. Eight (88.9%) participants said yes and one (11.1%) said maybe. Lastly, participants were asked if the survey adequately elicited parents' perceptions about their child's possible sleep disturbance. Six (66.7%) participants said yes and three (33.3%) participants said maybe.

The last question asked participants to provide questions that they thought should be included in the survey. According to the responses, participants stated that the survey should include more questions about sleeping habits during hospitalization, questions about behaviors during the hospital stay, and questions about parents' perceptions about leaving their child in the hospital. Other responses stated that the survey should ask parents whose child has experienced a hospitalization within the year and that the survey could be made to survey nurses instead of parents.

### **Discussion**

Based on the survey results, a majority of the participants' children were hospitalized around the age of 2. Most participants' children were admitted to the hospital for a few days to about 2 weeks. However, there were only two participants whose children stayed in the hospital for a month or longer. All parents, except one, stated that they always stayed with their child during their admission. Along with this, participants stated that they were with their child both days and nights. If participants did leave the hospital, it was only for a short amount of time that

only lasted a few hours. Furthermore, most participants were never separated from their child. Based on this information, most children did not experience a significant amount of separation from their parents to experience an effect.

When evaluating the immediate effects of hospitalization on separation anxiety, participants were asked three questions: if their child behaved differently towards parents or family members, if the child cried more, and if the child had difficulty being left alone. For participants who answered yes to these questions had children in the hospital for longer than a week (7 days, 10 days, and 1 month). Participants whose child was only hospitalized for less than a week saw no changes in behavior towards family members, no difference in the amount of crying, and no difficulty being left alone. Those who answered “maybe” to the question about the child having difficulty being left alone, both had their child admitted for only one night. The only outlier found was related to a child’s change in behavior toward parents and family members. One participant stated that instead of a negative behavior change towards family members, the child became more interactive and responsive after hospitalization.

The next question in the survey evaluated the immediate effects of hospitalization on sleep disturbances and regression to lower developmental stages. However, the results were similar to those discussed above. Participants who noticed changes in their child’s sleep patterns and development were the same participants who noticed their child behaved differently towards family members, cried more, and had difficulty being left alone. The participants whose children were hospitalized for 10 days and 1 month, also saw a difference in how their child interacted with their peers and friends.

Based on the presented information, a correlation may be present between a child’s length of stay and changes in their behavior. The children who stayed 7 days, 10 days, and 1

month were 15 years old, 7 years old, and 2 years old, respectively. As a result, the data shows that the experience in behavior changes after hospitalization is not specific to age.

Analyzing the responses in the survey evaluation, most participants found that the survey adequately evaluates the immediate effects of hospitalization on separation anxiety, sleep disturbances, and regression to lower developmental stages. In regard to parents' willingness to take the survey in clinical settings, participants stated "yes" or "maybe", with only one participant stating no. However, according to the end of the survey, 55.6% of participants believed that additional questions should be included to accurately evaluate immediate affects of hospitalization on a child.

### **Strengths and Limitations**

Strengths of this study included the wide age range of the participants children and the wide range in nursing experience. Since this was a pilot study, one goal was to test the content validity of the survey tool. One additional strength was the ability to gain feedback about the survey tool and how to improve it.

Unfortunately, many limitations were present during the data collection period. One limitation was the sample size. Nine responses cannot adequately determine if hospitalizations have immediate effects on a child's separation anxiety, sleep disturbances, and regression to lower developmental stages. Furthermore, the time for data collection was limited due to the amount of time in the academic semester and the period of time it took for IRBPHP approval. Additionally, an issue arose regarding the purpose of the survey itself. Participants stated to the researcher that there was confusion on who the target population was for the study and who was eligible to take the survey, which may have had an impact on the sample size. Lastly, the largest limitation was the COVID-19 Pandemic. Data collection began the beginning of April 2020,

which was around the beginning of shelter in-place orders and an increase in hospital demand. The survey specifically asked for past and current registered nurses who may have been working on the frontlines at the time.

### **Implications**

Children who were hospitalized longer than a week experienced separation anxiety (in the forms of behavioral changes with family members, increased crying, and an increased difficulty being left alone), sleep disturbances, and regression to lower developmental levels (“taking a step back” in regard to their developmental stage and interactions with peers and friends), despite having a parent presence for a majority of the stay. The data also revealed that children who were hospitalized for less than a week and had a parent present did not experience developmental or behavioral changes. Although this was only a pilot study and was used to evaluate the content validity of the survey tool, the data suggests there is a possible relationship between hospitalization and childhood development.

### **Conclusion**

Child hospitalizations and readmissions are increasing, which leads to a greater chance for a child to experience some form of trauma. The literature review and data presented above brings to light that an issue may exist when children are admitted into a hospital setting. Children with recurrent admissions can be at greater risk for experiencing sleep disturbances, separation anxiety, and regression to lower developmental stages. The pilot study brings to light possible issues, however more research is needed. Long-term, extensive research with a larger sample size should be conducted to determine if the relationship between hospitalization and child development is



valid. Once significant data is found, new nursing interventions can be developed and implemented to ultimately reduce the possible developmental effects of hospitalization.

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**Appendix A**

**IRB Application**

**DOMINICAN UNIVERSITY OF CALIFORNIA**

**INSTITUTIONAL REVIEW BOARD FOR  
THE PROTECTION OF HUMAN PARTICIPANTS**

**INITIAL APPLICATION**

*All information must be typed and submitted electronically to [irbphp@dominican.edu](mailto:irbphp@dominican.edu) Handwritten applications will be returned to researcher.*

*A signature page must accompany all applications. Numbers in parentheses refer to explanatory sections in the IRBPHP Handbook. Please use these as a guide in providing the requested information.*

**APPLICANT INFORMATION (8.1)**

**Name:** Vanessa Cahayag

**Date:** February 18, 2020

**School:** Dominican University of California

**Department:** Department of Nursing

**Campus or Local Address:** 50 Acacia Ave., San Rafael, CA 94901

**Home Address:** [REDACTED]

(Note: If different from campus/local address please provide home address for contact during periods when you may not be living on campus or locally)

**Local Phone:** [REDACTED]

**Work Phone:** [REDACTED]

**E-mail Address:** [REDACTED]

(Note: All communication regarding your application will be by email so be sure you include a functional email address)

**Name(s) of Co- Investigator(s):** N/A

**FACULTY ADVISOR INFORMATION: (8.2)**

**Name:** Dr. Kathleen Beebe

**Campus Phone:** (415) 257-1330

**E-mail Address:** [kathleen.beebe@dominican.edu](mailto:kathleen.beebe@dominican.edu)

Note: All communication regarding a student's application will be by email. Advisors will be copied on all correspondence so be sure to provide a functional email address.

**RESEARCH PROJECT INFORMATION: (8.3)**

**Exact Title of Project:** Hospitalization and child development: Immediate effects on sleep disturbances, regression to lower developmental stages and separation anxiety

**Duration of Project** (cannot exceed 1 year): 3 months

**Category of Review:**

- ☐ Exempt (5.3.1)
- ☒ Expedited (5.3.2)
- ☐ Full Board Review (5.3.3)

**Background and Rationale** (no more than 300 words). Describe nature of research problem and purpose of current study. **(8.4)** Include references at end for any works cited.

When a child is born, parents, family members, and even medical professionals wish for a healthy child. However, it is impossible to entirely avoid illnesses during childhood. Whether it be an acute illness, such as the common cold, or a chronic illness, such as cystic fibrosis, childhood illnesses are inevitable. Although it is tough for us adults to see children in the hospital, imagine the effect hospitalizations have on the pediatric patients themselves. Children who experience long-term critical care may experience different forms of trauma that can ultimately affect their cognitive, emotional, and psychosocial development (Bakri et al., 2014; Bell et al., 2016; Davies, Hartfield & Wren, 2014; Dolidze, Smith & Tchanturia, 2013). Healthcare professionals may tend to disregard the developmental effects of hospitalizations on a child and focus more on the treatments of their diagnosis. Overall, the potential effects on the development of a child experiencing short-term treatments, such as ear irrigation greatly differs from the potential effects on the development of a child experiencing long-term treatments such as chemotherapy treatment, traction, or injury recovery. Healthcare professionals need to realize these differences and implement supportive interventions. Literature has shown that longer hospitalizations affect sleep disturbances, separation anxiety and regression to lower developmental stages (Branstetter, 1969; Meltzer, Davis & Mindell, 2012). This pilot study will test the content validity of a tool designed to measure the immediate effects of hospitalization on sleep disturbances, regression to lower developmental stages, and separation anxiety in children for possible use in future research.

**Description of Sample:** (check the boxes that pertain to your sample) **(8.5)**

- ☐ Patients as participants
- ☒ Non-patient volunteers
- ☐ Students as participants
- ☐ Minor participants (less than 18 years)
- ☐ Participants whose major language is not English (Note: include copies of translated documents)
- ☐ Mentally disabled patients
- ☐ Prisoners, parolees, or incarcerated participants

☐ Other vulnerable or sensitive populations (children, persons with alcoholism or drug addiction, LGBT individuals, etc.) Please identify:

☒ Participants studied at non-Dominican locations

☐ Filming, video, or voice recording of participants

☐ Data banks, data archives and/or registration records

☒ There is a dual relationship between researcher and participant (explain):

Select participants are current Dominican nursing professors, clinical preceptors, and pediatric registered nurses with at least one year of inpatient pediatric care.

**Recruitment Procedure:** Indicate how applicant will solicit participation (face-to-face, phone contact, mail, email, etc.) along with copies of materials used to recruit participants and permission letters if applicable: **(8.6)**

The researcher will use a snowball sampling procedure and will solicit participation through face-to-face contact, email, or through collaboration with Dr. Luanne Linnard-Palmer, a pediatrics content expert.

**Subject Consent Process:** Attach Informed Consent Forms to be used. If consent forms are not to be used, explain why and provide copy of the Consent Cover Letter. **(8.7)**

A consent cover letter will be provided in the link. Furthermore, the completion of the voluntary survey establishes the participant's consent. (see Appendix A)

**Procedures:** Describe in detail what your participants will experience and include copies of all written materials participants will see including surveys, questionnaires, interview questions, etc. Permission to use any copyrighted materials should be included. **(8.8)**

Participants will be contacted and referred through snowball sampling. Once contacted, the participant will receive a link to the survey and will be asked to voluntarily review and answer the questions. No identifying information will be solicited and the participant will be asked to spend approximately 10 to 15 minutes completing the online survey. They will be able to exit the survey at any time without consequence to them. Because the respondents are themselves health care professionals, they will not only be asked about their personal experiences with their child's hospitalization, but they will also have

an opportunity to provide feedback about their perceptions of the face and content validity of the survey instrument. (see Appendix B)

**Potential Risks to Participants:** Describe all potential risks.

*Note: All research projects involve some potential risks to participants. Applications that do not address risks will be returned. (8.9)*

There is a risk of loss of anonymity whereby the participants may inadvertently disclose information about themselves.

**Minimization of Potential Risk:** Describe ways the Potential Risks to Participants (detailed in section above) will be minimized by researcher. (8.10)

The survey is designed to be completed anonymously. Names will not be included in the survey. However, because anonymity cannot be guaranteed, participation in the survey will be voluntary and the participants can withdraw participation at any time. All data will be held in strict confidentiality and accessible only to the researcher and her faculty advisors.

**Potential Benefits to Participants:** Describe in detail all potential benefits to the individual (focus is individual not society). There is always some benefit – why else do the study. (8.11)

The participants can reflect on their child's possible behavioral changes after hospitalization. The participants will also aid in the instrument validation process.

**Costs to the Participants:** Describe any costs to participants (transportation, time, effort, etc.). (8.12)

The survey will cost the participant 10 to 15 minutes of their time.

**Reimbursement or Compensation to Participants:** Describe and provide rationale for any reimbursement or compensation in response to participation in the research. (8.13)

The survey will be completely voluntary, and participants will not receive reimbursement or compensation.



**Confidentiality of Records: (8.14)**

☐ Data will be anonymous

How will anonymity be ensured?

☒ Data will not be anonymous

How will data be kept confidential? Who will see it?

No personal identifying information will be solicited during data collection. Data will be kept and stored in a private proprietary folder through Google Survey. The data will only be revealed to the student's faculty advisor and the student.

How will raw data and computerized data be stored?

Data will be stored within a password protected Google Survey folder, only accessible by the student and her advisor. Any raw data downloaded to hardware will be kept on a secured and password protected computer. Data will be deleted and destroyed within 1 year of collection.

How will participant identity be kept separate from participant data?

Names, ages, and/or birthdates of participants will not be solicited in the survey.

***(Note: all tapes and records should be destroyed after a period of one year following completion of the research project)***

## Appendix B

## IRB Signature Page

APPENDIX B

**IRBPHP  
SIGNATURE PAGE (8.15)**

Select Type of Application: ☒ Initial ☐ Renewal ☐ Modification

Applicant Name: Vanessa Cohnyag

Project Title: Hospitalization and child development: Immediate effects on sleep disturbances, regression to lower developmental stages and separation anxiety

**Signatures:**  
I acknowledge that all procedures will meet relevant local, state, and federal regulations regarding use of human participants in research. I am familiar with and agree to adhere to the ethical principles in the conduct of research with human participants as set forth by the Dominican University of California IRBPHP Handbook.

\_\_\_\_\_  
Signature of Applicant/\_\_\_\_\_  
Date 03/18/2020

\_\_\_\_\_  
Signature of\_\_\_\_\_  
Date 3/20/2020

\*Your signature indicates that you accept responsibility for the research described, including work by students under your supervision. It further attests that you are fully aware of all procedures to be followed, will monitor the research, and will notify the IRBPHP of any significant problems or changes.

\***Category of Review:** Determined by faculty advisor or researcher.  
(Note: See IRB Handbook pages 11-13 for category descriptions.)

☐ Exempt  
☒ Expedited  
☐ Full Board Review

**For Renewal and Modification Applications only:**  
☐ Category of Review changed from Initial

\_\_\_\_\_  
Signature of Department Chair  
Date 3/26/2020

\*\* Review by Dept Chair required for students in some disciplines.

\_\_\_\_\_  
Signature of Dean of School  
Date \_\_\_\_\_

\*\*\*Review by Dean is required for faculty researchers but not for student investigators unless this is a procedure of the School within which the student is majoring.

Please print and scan this signature page for your file and return electronically to [irbphp@dominican.edu](mailto:irbphp@dominican.edu)

## Appendix C

### Letter of Introduction to Participants in Anonymous Survey Research

Dear Study Participant,

My name is Vanessa Cahayag and I am an undergraduate Nursing major at Dominican University of California. I am conducting a research project as part of my senior thesis requirements, and this work is being supervised by Dr. Kathleen Beebe, Professor of Nursing at Dominican University of California. I am requesting your voluntary participation in my study, which concerns your child's past hospitalizations and its effects on sleep disturbances, developmental regression, and separation anxiety.

Participation in this study involves keeping a record of information about your child's past hospitalizations and its effects on your child's sleep disturbances, developmental regression, and separation anxiety. The study includes thirteen question survey that will be completed by the parent/guardian.

Please note that your participation is **completely voluntary** and you are **free to withdraw your participation at any time**. In addition, your survey responses are designed to be **completed anonymously**. Anonymity cannot be guaranteed, however, and in the unlikely event an identity becomes known, all information will be held as completely confidential. Filling out the questionnaire is likely to take approximately 10 to 15 minutes of your time.

If you choose to participate in this study, please fill out the attached materials as honestly and completely as possible. Remember, this survey is completely anonymous; do not put your name or any other identifying information on your survey form. If you choose not to participate, please exit out of the survey (responses will not be recorded).

If you have questions about the research, you may contact me at the email address below. If you have further questions you may contact my research supervisor, Dr. Kathleen Beebe at (415) 257-1330 or the Dominican University of California Institutional Review Board for the Protection of Human Participants (IRBPHP), which is concerned with protection of volunteers in research projects. You may reach the IRBPHP Office by calling (415) 482-3547 and leaving a voicemail message, or FAX at (415) 257-0165, or by writing to IRBPHP, Office of Associate Vice President for Academic Affairs, Dominican University of California, 50 Acacia Avenue, San Rafael, CA 95901.

If you would like to know the results of this study once it has been completed, a summary of the results will be presented at Dominican University of California's Academic Showcase in April 2020. Contact me at the email address below for further information.

Thank you in advance for your participation.

Sincerely,

Vanessa Cahayag  
Dominican University of California  
50 Acacia Avenue  
San Rafael, CA 94901  
Email address: [vanessa.cahayag@students.dominican.edu](mailto:vanessa.cahayag@students.dominican.edu)

## Appendix D

### Survey and Survey Evaluation Questions

1. Thinking about your child's most recent hospitalization, how old was your child when they were hospitalized?
2. For how long was your child hospitalized?
3. Did you stay in the hospital with your child?
  - a. Never
  - b. Occasionally
  - c. Sometimes
  - d. Often
  - e. Always
4. If you responded sometimes or always, days, nights, or both?
  - a. Days
  - b. Nights
  - c. Both
5. If you did not stay with your child, how often did you visit?
6. Before hospitalization had your child been previously separated from you? If yes, for how long?
7. After hospitalization, did your child interact with you or other family members differently? If yes, in what way?
8. After hospitalization, did your child tend to cry more than usual?
  - a. Yes
  - b. No
  - c. Maybe
9. After hospitalization, did your child have difficulty being left alone?
  - a. Yes
  - b. No
  - c. Maybe
10. Did you notice changes in your child's sleeping patterns after hospitalization? If yes, in what way?
11. If applicable, after hospitalization, did your child "take a step back" in any aspect of his/her development: If yes, in what way?
12. If applicable, did your child's schoolwork quality or grades change after hospitalization? If yes, better or worse?
13. If applicable, did your child act differently towards peers or friends in school after hospitalization? If yes, in what way?

**Survey Evaluation Questions**

**As a pediatric nurse, please answer the following questions about yourself and the quality of the survey you just took.**

1. How long have you been working as a pediatric registered nurse?
2. Do you think patient's parents would be willing to respond to the survey questions?
3. Do you think this survey adequately elicited parents' perceptions about their child's possible separation anxiety?
4. Do you think this survey adequately elicited parents' perceptions about their child's possible developmental regression?
5. Do you think this survey adequately elicited parents' perceptions about their child's possible sleep disturbance?
6. Are there any questions you would include in this survey?

## Appendix E

### Article Template

#### Clinical Nursing Problem/Clinical Issue/Research Question:

Do hospitalizations during childhood have immediate effects on sleep disturbances, regression to lower developmental stages and separation anxiety?

This template is intended as an aid to the development of your final paper. How many articles do you have? What similarities or dissimilarities do you notice across this body of evidence you are reviewing? Include supportive as well as opposing perspectives of a clinical issue. Ensure that each of studies is relevant to the clinical issue of interest you have identified for this course. **Major strengths and weaknesses include your critique of the work, not only what the authors have written.** Students may type on this, header rows will repeat on subsequent pages. Alternatively, students may submit this in 'portrait' vs. 'landscape orientation using each of the headings below to describe responses for articles reviewed. Contact the instructor for questions.

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
1. D. Davies, D. Hartfield, T. Wren (2014)	Children with chronic complex conditions account for a steadily increasing proportion of hospitalized paediatric patients and health care resource consumption (2). Two decades ago,	The purpose of the present study was to describe the population of children who experienced a very long hospital stay. Although beyond the scope of the present study, better understanding this patient population	A retrospective study was undertaken of all infants and children who were hospitalized at the Stollery Children's Hospital in Edmonton, Alberta between January 1, 2007 and	At the beginning of the study period in 2007, there were 133 beds, which had increased to 146 beds by the end of 2012 when the study concluded	A list of all eligible patients was generated by a health information analyst through an automated system.	Twentyfour (39%) children had involvement of psychiatry services during their time in hospital. Of these, 12 (50%) children were assessed for concerns about depression or	Strengths: Study was conducted over period of time, The sheer magnitude of the numbers pertaining to length of stay, geographical separation of children and families, morbidity and death is,

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
	a long hospitalization of a child was considered to be >1 week (3). Currently, long hospitalizations are counted in months and even years. Increasing length of stay and acuity of stay has been well documented at the Stollery Children's Hospital in Edmonton, Alberta, in the neonatal intensive care unit (NICU), PICU and wards (internal documents),	is important because of the inevitable impact long hospitalization has on children, their families and health care resource utilization.	December 31, 2012, for 180 consecutive days or longer.	(mean 137 beds/year). This includes all ward/PICU/NICU beds. Total of 61 patients.		anxiety. Two children were diagnosed as having significant attachment problems. The remaining consultations occurred primarily because of concerns about delirium	perhaps, a wake-up call for those involved in paediatric inpatient care to more mindfully anticipate the possible trajectories of patients. Limitations: The present study was limited by its retrospective nature; this was complicated by the fact that a majority of medical records had been converted to microfiche as a single continuous reel, with an

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
	which is similar to the trends of other tertiary/quaternary paediatric hospitals						inaccessible paper source document.
2. K. B. Obaid (2015)	A diagnosis of cancer often involves long hospital stays from days to months for the pediatric oncology patient in Iraq with limited access to psychologists, psychiatrists and social workers. Consequently, many patients experience psychosocial problems as a result. The hospitalization have	The aims of this study was to assess psychosocial impact of hospitalization on ill children, ages from 6 to 12 years in Pediatric Oncology Wards and to find relationship between sociodemographic variables for child ,family and illness such as child's gender, age, type of treatment, frequency of hospitalization, parental education, etc.	Data collection included interviews with (n=75) of parents of pediatric oncology patients from the Children Welfare Teaching Hospital and Central Child Teaching Hospital in Baghdad city (2012 to 2013).The Child Behavior and Psychosocial Problems checklist was	A non-probability (purposive) sample seventy-five 75 parents of children, ages 6-12 years, suffering from cancer.	Method of data collection the investigator held a direct interview to obtain data from child's parent member who responsible about care of children and staying with their children during hospitalization.	According to this study about (66.0%) of children experience mild psychosocial effects during inpatient stays. These results supported by study conducted by (Crnković et al. 2009) (1) that found the majority of children (78%) have negative thoughts about their homes, families , schools and friends while at hospital.	Strengths: Study conducted in two different settings; study considered the demographics of the population. Limitations: Questionnaire could have different interpretations; parents could have lied.



Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
	impact on children's psychosocial status in many ways such as problem in the behavior, personal feelings, or interpersonal relationships of a child with family, school, and community(1)		used to evaluate psychosocial impact.				
3. Janet E Rennick, Geoffrey Doughert, Christine Chambers, Robyn Stremler, Janet E Childerhose, Dale M Stack, Denise Harrison, Marsha	: Pediatric intensive care unit (PICU) hospitalization places children at increased risk of persistent psychological and behavioral difficulties following discharge. Despite tremendous advances in	This study aims to examine psychological and behavioral responses in children aged 3 to 12 years over a three year period following PICU hospitalization, and compare them to children who have undergone ear, nose and/or	Participants will be recruited from 3 Canadian pediatric hospitals, and followed for 3 years with data collection points at 6 weeks, 6 months, 1 year, 2 years and 3 years	This mixed-methods prospective cohort study will enrol 220 children aged 3 to 12 years during PICU hospitalization (study group, n = 110) and ENT day	Standardized questionnaires and open-ended interviews	N/A	Strengths: The mixed-methods design is expected to produce substantial, nuanced data on the trajectory of children's psychological and behavioral responses to PICU hospitalization

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
Campbell-Yeo, Karen Dryden-Palmer, Xun Zhang, and Jamie Hutchison (2014)	medical technology and treatment regimes, approximately 25% of children demonstrate negative psychological and behavioral outcomes within the first year post-discharge.	throat (ENT) day surgery	post-discharge. Psychological and behavioral characteristics of the child, and parent anxiety and parenting stress, will be assessed prior to hospital discharge, and again at each of the 5 subsequent time points, using standardized measures.	surgery hospitalization (comparison group, n = 110). Participants will be recruited from 3 Canadian pediatric hospitals			and their long-term recovery Limitations: Does not have conclusive results
4. Nathiana B. Silva, Flávia L. Osoário (2018)	The use of AAT in the oncological context has been reported in several studies in adult populations. However, no	The objective of this study was to propose an intervention and safety protocol for performing animal-assisted therapy (AAT) and evaluating its efficacy in children	This study used a quasi-experimental design. The AAT programme consisted of three 30-min sessions per week. The	24 patients hospitalized from June 2015 to June 2017. Both genders aged 6 to 12 years;	Child stress symptoms inventory, quality of life evaluation scale, child depression inventory, adapted Brunel mood	Improvements in pain level, irritation, stress, and decreased depression symptoms. No changes in psychological. Improved	Strengths: Had very strict inclusion and exclusion criteria, considered caregiver affects, approved by ethics

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
	experimental quantitative studies have evaluated the effect of AAT in children to date. Paediatric oncology is inserted into this context, because the diagnosis and treatment of childhood cancer causes physical and emotional suffering for children and increases their vulnerability to the development of psychological disorders, which may directly or indirectly	under outpatient oncological treatment based on psychological, physiological, and quality of life indicators for the children and caregivers.	intervention occurred in an open group with a maximum of seven participants.	Diagnosis of a solid tumour; Diagnosis of acute lymphoid leukaemia (in maintenance treatment in phase B of the RELLAB and RELLAT protocols, both starting at week 53 of maintenance B, and in the maintenance phase of the BFM 2002 protocol; Undergoing outpatient oncological	scale, faces pain scale, AAT assessment questionnaire, state-trait anxiety inventory, brunel mood scale, sociodemographic and clinical identification questionnaire, BP3A BOH-G-tech semi-automatic pressure meter for blood pressure and heart rate	caregiver anxiety, stress, and depressive symptoms. No worsening of patient symptoms. AAT was more effective than other leisure activities used in the hospital setting, such as reading, interaction with volunteers, and recreational activities probably due to the specificities of the affiliative and affective relationship between dogs and humans.	committees for animals and humans. Weakness: Observation period not long enough to evaluate psychological changes, sample size was small, quasi-experimental exam with no control group, restricted to certain types of tumors, conducted in Brazil

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
	affect their general clinical condition.			treatment; Showing a good clinical status after evaluation, with authorization to participate in the study by the responsible physician.			
5. Megan F. Bell, Donna M. Bayliss, Rebecca Glauert, Amanda Harrison, Jeneva L. Ohan (2016)	Previous research examining the relationship between academic outcomes and child health has demonstrated that children and adolescents with chronic illnesses have lower achievement trajectories	This study examined the association between chronic illness and school readiness, by using linked administrative population data.	The impact of child chronic illness on 5 developmental domains (social, emotional, language, cognitive, and physical) at school entry was analyzed	The study included WA children born in 2003–2004 with a 2009 Australian Early Development Census (AEDC) record (N = 24 340).	Logistic regression models were fitted with maximum likelihood estimation by using SAS version 9.3 for Windows (SAS Institute, Inc, Cary, NC)	In the unadjusted models, chronic illness was associated with an increased risk of developmental vulnerability across all domains. Children were ~20% to 35% more likely to be classified as	Strengths: missingness was included in the regression models, any bias created by missing information should be minimized, Large population size, Has ethics approval

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
	compared with their healthy peers, because of factors such as increased school absences and greater disengagement from school. However, there is little evidence regarding the impact of poor health on the child at the start of school, when school absence and disengagement are unlikely to be implicated					vulnerable/at-risk on all AEDC domains if they had a chronic illness, compared with their well peers.	Weakness: the amount of missing parental information on sociodemographic variable, hospital data may be subject to selection bias because there is usually a higher rate of hospital admissions among disadvantaged groups, due to issues of availability and affordability of primary health care services, chronic illness was identified only from hospital data sets, it is possible that rates of chronic illness

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
							were underestimated, because in metropolitan areas, the majority of people will attend their primary care physician (and not a hospital) for management of chronic conditions,
6. Mohamed H. Bakri, Eman A. Ismail, Ghada O Elsedfy, Mostafa A. Amr, and Ahmed Ibrahim (2014)	Sickle cell disease (SCD) in children with a history of repeated hospitalization is distressing for children as well as their parents leading to anxiety and has negative effects on the psychological state of	To determine the overall effect of SCD on the behavior of young children age 1½ to 5 years old who had repeated history of hospitalization, compared to a control group of healthy children attended a vaccination clinic.	The interviews were carried out on the same day of attending the clinics in the afternoon in a separate room away from the busy clinics by trained nurse under the supervision of the investigators.	35 children with sickle-cell disease and 35 children without sickle cell disease. All 1 ½ to 5 years old. Located at Al-Ahsa Hospital-Al-Ahsa city, Saudi Arabia	Child behavior checklist and a diagnostic a statistical (DSM) – oriented scale; a self-rated questionnaire, the toddler-preschooler postoperative pain scale, DSM-IV-TR, Statistical package for social science	There was no statistically significant difference between the two groups in age, gender, or residence. The mean score of emotional reactivity (62.9 vs. 53.4; P < 0.001) was significantly higher among the SCD group than the	Strengths: Use of known data collection measures, use of technology to compute data, approved by hospital research and ethics committee.  Weaknesses: Small sample size, data were collected

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
	children and their families					control healthy group. However, the mean score of attention problems shows no statistically significant difference between the two study groups. The SCD children have a statistically significant difference in behavioral changes on CBCL compared to the control group (healthy children); anxiety/depression (65.2 vs. 55.1, $P < 0.001$ ); somatic complaint (66.7 vs. 54.4,	retrospectively during interview with children's parents that may have possibility of recalling bias.

Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
						<p><math>P &lt; 0.001</math>); withdrawn (63.4 vs. 53.2, <math>P &lt; 0.001</math>); aggressive behavior (60.4 vs. 56; <math>P = 0.04</math>), internalizing (64.7 vs. 51.5; <math>P &lt; 0.001</math>), and externalizing symptoms (56.5 vs. 50.7, <math>P = 0.01</math>), respectively. There was statistically significant difference between the study group and control group in means score of affective (67.2 vs. 58.1; <math>P &lt; 0.001</math>), anxiety problems (65.6 vs. 57; <math>P &lt;</math></p>	



Authors & Publication Year	Theoretical Framework	Research Question	Study Design	Population & Sample Size	Instruments	Findings	Major Strengths & Weaknesses
						0.001), pervasive developmental problems (60.9 vs. 53.9, $P < 0.001$ ), and oppositional defiant problems (60.6 vs. 56.7; $P = 0.03$ ), respectively.	
7. William H. C. Li, Joyce Oi Kwan Chung, Ka Yan Ho, Blondi Ming Chau Kwok (2016)	Hospital play interventions have been widely used to prepare children for invasive medical procedures and hospitalization. Nevertheless, there is an imperative need for rigorous empirical scrutiny of the effectiveness of hospital	This study tested the effectiveness of play interventions to reduce anxiety and negative emotions in hospitalized children.  Hypotheses: Children who received the hospital play interventions would exhibit fewer negative emotions when compared with children who	A quasi-experimental study was conducted in two public hospitals in different areas of Hong Kong, with one assigned as the 'control' and the other as the 'experimental' hospital. The hospitals have similar paediatric specialties,	Participants were recruited from the two hospitals, ages 3 to 12, speak Cantonese, and required to stay in hospital for at least three consecutive days. 304 patients total; 154 received	Experimental group received hospital play interventions conducted by hospital play specialists. Meetings set up between Playright (professional organization that organizes a variety of children's play programs for the public) and research team. 30 minutes of	Children who received the hospital play interventions exhibited fewer negative emotions and experienced lower levels of anxiety than those children who received usual care.	Strengths: The experimental and control groups in the two age groups were similar in respect of the children's ages, sex, diagnoses, number of hospital admissions, and baseline anxiety scores, indicating a high level of comparability

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	play interventions, in particular, using play activities to ease the psychological burden of hospitalized children.	received usual care; Children who received the hospital play interventions would experience lower levels of anxiety when compared with children who received usual care.	settings, and medical and nursing care	play and 150 received usual care.	play a day either in playroom or at bedside.  Visual analogue scale, Chinese version of the state anxiety scale for children, children's emotional manifestation scale,		of variance between the two groups  Weaknesses: Different methods of assessment were used for the two age groups (3-7 and 8-12) due to different cognitive levels, to randomize individual patients within a hospital pediatric unit is not feasible as there is a chance of contamination between different treatment groups in the same setting, and parents anger if child got different

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							treatments. Convenience sampling and play interventions was only implemented in one hospital, study only observed children's anxiety levels and emotional responses on two consecutive days
8. Khatuna Dolidze, Emma L. Smith, Kate Tchanturia (2013)	Conceptual framework: hospitalization can be viewed as an ongoing transaction between the person and their environment that results in an emotional appraisal	In this study we tested the hypotheses that (a) self-drawings of hospitalized children (with CHD) and non-hospitalized children will show significant differences (b) pre and post-surgery self-drawings will show significant differences and	Children were provided with 12 colored pencils or crayons and plain paper and asked to draw their portrait. Hospitalized children were asked to draw twice: 1–2 days prior to and 3–6 days after the surgery, depending on their health	293 children total. 168 were children in the JoAnn Medical center	Draw-A-Person method in which chi-square analyses showed significant differences between the types of emotional indicators identified in drawings by	Hospitalized children produce drawings that differ significantly from drawings by non-hospitalized children. Within the projective drawing literature,	Strengths: Shown to aid assessment of emotional well-being during illness and hospitalization, nonverbal form of communication could alert professionals to children's

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		(c) interpreting these group differences according to the Emotional Indicators of Human Figure Drawing system (Skybo et al., 2007; Koppitz, 1968) and other interpretative principles (Burns & Kaufman, 1972) will be informative and meaningful.471Clinical Tool for Evaluating Emotional Well-Being	condition after their treatment. The researcher ensured that the interview process lasted between 15 and 30 minutes in order to minimize fatigue. Control drawings were collected from non-hospitalized children in their school or preschool.		emotionally disturbed and non-clinical children	researchers have reported changes in drawings over time that reflect shifts in self-concept, attitudes, the need for interventions and levels of anxiety	anxieties, changes in emotional state or a need for psychological support.  Weaknesses: Broad age range and limited number of age groups, Approach is highly subjective (may need a second judge and second analysis for future studies)

Adapted from Polit, D.E. & Beck, C.T. (2008). *Nursing research: Generating and assessing evidence for nursing practice* (8<sup>th</sup> ed., pp. 117-127). Philadelphia: Wolters Kluwer/Lippincott Williams and Wilkins